CLAIMS

We claim:

1. A method for treating wastewater, comprising:

treating wastewater to produce an effluent suitable for membrane filtration, the treating incorporating processes substantially free of aerobic biological treatment;

treating the effluent using a membrane filtration system to produce a permeate stream consisting essentially of refined water and a waste stream comprising soluble organic matter and inorganic salts; and

routing said waste stream through said high-rate anaerobic digestion process to stabilize the soluble organic matter and produce a biological gas, said biological gas comprising methane.

2. The method as in claim 1 wherein the step of treating the wastewater to produce an effluent suitable for membrane filtration includes providing primary treatment of the wastewater.

3. The method as in clam 2 wherein the step of providing primary treatment of the wastewater includes settling of the wastewater to remove bulk solids from the wastewater and addition of chemicals to aid solids removal.

4. The method as in claim 2 wherein the step of providing primary treatment of the wastewater includes screening of the wastewater to remove bulk solids from the wastewater wherein said screening size range is approximately 10 to 1,000 microns.

5. The method as in claim 1 wherein said membrane filtration system is selected from the group consisting of a microfiltration system, an ultrafiltration

system, a nanofiltration system, a reverse osmosis system, or combinations thereof.

6. The method as in claim 1 wherein said high-rate anaerobic digestion process is an up flow anaerobic sludge blanket system.

7. The method as in claim 1 further comprising the step of routing a solids stream from said membrane filtration system to a solids thickening element.

8. The method as in claim 7 further comprising the step of recycling a recycle stream from said solids thickening element to a pretreatment system and routing a solids stream for anaerobic digestion.

9. A method for treating wastewater comprising:

directing the wastewater through a screening apparatus to remove suspended solids from the wastewater, to produce a screened effluent;

directing the screened effluent through a microfiltration system to produce a microfiltration effluent;

directing the microfiltration effluent through a membrane system selected from the group consisting of a reverse osmosis system, a nanofiltration system, an ultrafiltration system, and combinations thereof, to produce a permeate stream consisting essentially of refined water and a waste stream comprising soluble organic matter and inorganic salts; and

routing the waste stream through an up flow anaerobic sludge blanket system to stabilize the soluble organic matter and produce biological gas, the biological gas comprising methane.

10. A system for treating a wastewater stream comprising:

a pretreatment system substantially free of aerobic biological treatment in communication with a wastewater influent;

a screen element in communication with said pretreatment system wherein said screen element having apertures formed therein with a size range of approximately 10 to 1,000 microns;

a primary membrane element in communication with said screen element;

a secondary membrane element in communication with said primary membrane element wherein said secondary membrane having an effluent stream output and a concentrate effluent stream output; and

a solids thickening element in communication with said primary membrane element and communicating a thickened solids stream to an anaerobic digestion process.

11. The system as in claim 10 wherein said primary membrane element is a microfiltration process having a filter pore size of approximately 0.03 to 0.3 microns.

12. The system as in claim 10 wherein a high rate anaerobic digestion system is in communication with said secondary membrane element for receipt of said concentrate effluent stream output and said high rate anaerobic digestion system having a methane gas output and a digestion system fluid effluent.

13. The system as in claim 10 wherein said solids thickening element is in communication with said pretreatment system for communication of a recycle stream.

14. The system as in claim 10 wherein a separation process is in communication with said secondary membrane element for receipt of said concentrate effluent stream into a separation stream and a disposal stream.

15. The system as in claim 14 wherein said separation process is an evaporation process.

16. The system as in claim 10 wherein said thickened solids stream having a thickened solids content of approximately 2.5 to 5.0 percent solids.

17. The system as in claim 10 wherein a permeate stream from said primary membrane element is routed to the ocean.